

research will show us how it can be used to obtain correct results. However, with our artificial honey it worked very satisfactorily, and this was encouraging. Then we started with our asbestos tubes just in the same way as we had done with the honey. What was the result of drying at the temperature of boiling water in the water for over 24 hours? We found that there was a loss of 10 per cent of the sugars, due to decomposition of the levulose. If we had been working on honey with the drying method that loss would have been put down to water. But I knew exactly the amount of levulose and dextrose I had in that tube and 10 per cent of that weight was gone. Hence dextrose does not decompose at that temperature we know it must have been levulose that disappeared. When we put the tubes back again in the bath and left them there 120 hours Did they still show 10 per cent loss? No, they showed between 18 and 19 per cent loss. These results throw discredit on this method of analysis for the determination of water in honey. Then we equalized drying it at 70 degrees centigrade. We wished to see if the levulose would decompose at that temperature and we found that it did. After 24 hours there is something like 15 per cent loss which under ordinary circumstances I should have attributed to water, but which under these circumstances was plainly due to decomposition of the levulose. In this research I feel justified in making the statement that the percentages of water returned by the methods as present in genuine honey are so high.

You must not understand that I am adversely criticizing the public analysts; they have employed the method by which we estimate

moisture in substances. It is only because of the presence of this peculiar constituent levulose which is so ready of decomposition that the method is unreliable.

It is only right that I should here add that several investigators in recent times have noted the ready decomposition of levulose above 70 degrees centigrade. Special attention is called to this fact by Carr and Sanborn in Bulletin 47, U. S., Department of Agriculture, Division of Chemistry. These authors devised an apparatus for drying in vacuo at any desired temperature and which gave very satisfactory results.

During the coming year I purpose as time permits to follow up this investigation. We shall first endeavor to obtain a method whereby we shall accurately ascertain the amount of water in the honey. If we are successful in finding such a process—and I think we shall be—we shall next proceed with this question of immature and mature honey. Next year I trust I shall have something of a satisfactory nature to report to

One word about ripe and unripe honey. It appears that much depends upon the season—upon the honey flow—as to whether there will be much unripe honey. Much wet and cloudy weather is conducive to there being unripened honey in the hive. This past season the honey flow was good and the honey ripened up well.

Though I have brought with me several tables of data from the work on the honeys you see before you I shall not now place them on record, for I do not consider them—for the reasons I have stated—as accurate. I will make this statement, however, that the trend of our results shows that the uncapped, immature, honey contains more water than the fully